Climate Change Rating Results 2020

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Abstract

This work is related to the Climate Change Rating of Countries (CCR). The parameters included in the rating are CO2 emissions per capita and per GDP, cumulative CO2 emissions in the last 30 years, and change in the emissions in the last 10 years.
The parameters are compared to the world averages.
The A-G rating groups are according to the CCR limits. The best rating (A) is for the lowest CCR. The average 2020 rating of Group A is 43 (57% below the world average) and of Group G – 210 (110% above the world average).
The world average CCR value is 100, equivalent to Group E.
Most of the world's CO2 emissions in 2020 were by countries in Group G (Black Group) with the worst climate change rating.

Keywords: Climate Change, Global Warming, CO2 emissions, CO2 per capita, CO2 per GDP, CO2 emissions per capita, CO2 emissions per GDP, Climate Change Rating, Global Warming of countries, climate justice, carbon justice

Glossary

$$GDP	$2017 of cumulative GDP in the last 30 years
Ave	average
CCO2	global cumulative CO2 emissions according to publication [1], CO2 emissions produced from fossil fuels and cement production only – land use change is not included, tCO2
CCp$$	country's cumulative CO2 emissions in the last 30 years per cumulative GDP in the same period
CCp$$W	weight of parameter CCp$$
CCR	Climate Change Rating of countries according to this work
CGP	Conservative Global Parameter, decreasing only world parameter applied to the CCR
CO2	emissions of Carbon Dioxide, CO_2
Cp$	country's CO2 emissions per GDP in the last year, tCO2/$GDP (ton CO2 per year, per $GDP 2017 per year)
Cp$10	country's change in Cp$ in last 10 years, tCO2/$GDP
Cp$10W	weight of parameter Cp$10
Cp$W	weight of parameter Cp$
CpC	country's CO2 emissions per capita in the last year, tCO2/y,cap
CpC10	country's change in CpC in last 10 years, tCO2/y,cap
CpC10W	weight of parameter CpC10
CpCW	weight of parameter CpC
GDP	Gross Domestic Product, constant international $ 2017, $GDP/y
Global Warming	global surface temperature change over land+ocean above 1850-1900 baseline, °C
OWID	Our World in Data – Internet site [1]
tCO2	metric ton of CO2

tCCO2	metric ton of cumulative CO2 in the last 30 y
tCO2/y,cap	metric ton of CO_2 per year, per capita
WB	World Bank
WCCp$$	world cumulative CO2 emissions in last 30 years per cumulative GDP, tCO2/$GDP
WCp$	world CO2 emissions per GDP in the last year, tCO2/$GDP
WCp$10	world change in Cp$ in last 10 years, tCO2/$GDP
WCpC	world CO2 emissions per capita in the last year, tCO2/y,cap
WCpC10	world change in CpC in last 10 years, tCO2/y,cap

Climate Change Rating of Countries

Climate Change Rating of Countries (CCR) was introduced in the publication [1]. The parameters included in the rating are CO2 emissions per capita and per GDP, cumulative CO2 emissions in the last 30 years, and change in the last 10 years. The parameters are compared to the world averages. The rating is related to the specific CO2 emissions, lower value results in a better rating.

Parameters Included in the Rating

Table 1 - Parameters included in the rating

Parameter	Country Symbol	World Symbol	Unit
CO2 emissions per capita	CpC	WCpC	tCO2/y,cap
CO2 emissions per GDP	Cp$	WCp$	tCO2/$GDP
Cumulative CO2 in the last 30 years per cumulative GDP in the same period	CCp$$	WCCp$$	tCO2/$GDP
Change in CpC in the last 10 years	CPC10	WCPC10	tCO2/y,cap
Change in Cp$ in the last 10 years	CP$10	WCP$10	tCO2/$GDP

Weights of the CCR Parameters

Table 2 - CCR parameters weight

Parameter	Parameter Symbol	Weight	Weight Symbol
Cumulative CO2 in the last 30 years per cumulative GDP in the same period	CCp$$	20%	CCp$$W
CO2 emissions per capita	CpC	25%	CpCW
CO2 emissions per GDP	Cp$	25%	Cp$W
Change in CpC in the last 10 years	CpC10	15%	CpC10W
Change in Cp$ in the last 10 years	Cp$10	15%	Cp$10W
Σ		100%	

World CCR

The world CCR in 2020 is 100.

The CCR system is based on the correlation between countries' key parameters and the world's CCR parameters.

Table 3 - World data for 2020 [1]

Parameter	Symbol	Unit	World 2020
CO2 emissions in 2020		tCO2/y	34,325,692,000
GDP		$GDP/y	126,732,219,588,076
Population			7,840,952,832
Cumulative CO2 emissions in the last 30 years		tCCO2	864,284,220,582
Cumulative GDP in the last 30 years		$$GDP	2,590,775,267,367,470
Cumulative CO2 in the last 30 years per cumulative GDP in the same period	WCCp$$	tCCO2/$$GDP	0.000334
CO2 emissions per capita	WCpC	tCO2/y,cap	4.38
CO2 emissions per GDP	WCp$	tCO2/$GDP	0.000271
CpC before 10 years		tCO2/y,cap	4.62
Cp$ before 10 years		tCO2/$GDP	0.000332
Last CpC to CpC before 10 years	CpC10	tCO2/y,cap	95%
Last Cp$ to Cp$ before 10 years	Cp$10	tCO2/$GDP	81%

Countries with CCR Below and Above the World Average

The world CCR in 2020 is 100.

Table 4 - Countries with CCR below and above the world average

	Countries	%	tCO2/y	%
CCR<100	146	70%	9,307,130,402	27%
CCR>100	62	30%	25,008,145,718	73%

70% of the countries have a better CCR rating than the world average in 2020. However, the 30% minority of the countries with CCR worse than the world average is responsible for 73% of the world's CO2 emissions.

Rating A-G

Rating A-G includes 7 groups.
The dataset for the year 2020 includes 208 countries. On average there may be about 30 countries in each group.
The A-G rating groups are according to the rating limits. The best rating (A) is for the lowest CCR.
In the next years, the CCR limits will remain constant, which will cause a change in the number of countries in each group.

Table 5 - A-G groups limits

Rating	min CCR	max CCR	Color
A		50	Light Green
B	51	60	Dark Green
C	61	70	Light Blue
D	71	85	Dark Blue
E	86	100	Violet
F	101	150	Red
G	151		Black

Table 6 - A-G groups in 2020

Rating	Ave CCR	tCO2/y	% CO2	countries
A	43.1	64,240,675	0%	13
B	55.5	452,596,360	1%	24
C	65.8	1,289,499,182	4%	30
D	77.2	2,947,234,126	9%	44
E	91.9	4,553,560,059	13%	35
F	120.9	8,567,596,157	25%	34
G	209.6	16,440,549,561	48%	28

28 countries in Group G are responsible for 48% of the global CO2 emissions in 2020. The average CCR of Group G is 109% above the world CCR in 2020.

Table 7 - Group A

Rating A	Count 13		CCR 43	CCR List #	tCO2/y 64,240,675
AGO	Angola		40	4	20,275,710
YEM	Yemen		50	13	12,140,070
CMR	Cameroon		49	10	9,007,300
CRI	Costa Rica		47	8	7,081,740
UGA	Uganda		44	6	5,506,980
HTI	Haiti		49	9	2,617,750
COD	Congo Democratic Republic		32	2	2,482,880
TGO	Togo		43	5	2,243,692
MWI	Malawi		44	7	1,471,604
SOM	Somalia		27	1	578,264
DJI	Djibouti		34	3	363,306
GNB	Guinea-Bissau		50	12	329,383
LIE	Liechtenstein		50	11	141,996

Table 8 - Group B

Rating	Count	CCR	CCR	tCO2/y
B	24	56	List #	452,596,360
NGA	Nigeria	54	22	130,176,700
BGD	Bangladesh	58	35	90,825,300
PER	Peru	52	17	47,489,000
SWE	Sweden	55	23	36,514,800
CHE	Switzerland	57	26	34,241,000
SGP	Singapore	57	31	29,909,500
KEN	Kenya	53	19	18,275,830
TZA	Tanzania	52	16	12,294,180
AFG	Afghanistan	58	34	11,681,770
CIV	Cote d'Ivoire	57	29	10,963,870
SLV	El Salvador	58	32	6,500,980
URY	Uruguay	56	25	6,296,670
NIC	Nicaragua	54	21	4,556,960
MLI	Mali	59	37	3,928,360
NER	Niger	59	36	2,491,380
TCD	Chad	53	20	1,802,196
MLT	Malta	51	14	1,599,570
SWZ	Eswatini	56	24	1,060,034
TLS	East Timor	57	27	718,671
GMB	Gambia	57	28	613,851
SLB	Solomon Islands	57	30	309,364
CAF	Central African Republic	52	15	214,242
STP	Sao Tome and Principe	58	33	124,398
TUV	Tuvalu	53	18	7,734

Table 9 - Group C

Rating	Count	CCR	CCR	tCO2/y
C	30	66	List #	1,289,499,182
BRA	Brazil	67	59	442,306,000
FRA	France	67	57	280,032,000
PAK	Pakistan	70	63	210,383,700
COL	Colombia	62	41	85,525,800
ECU	Ecuador	70	65	34,457,500
HKG	Hong Kong	63	44	31,504,900
DNK	Denmark	65	50	28,281,900
LKA	Sri Lanka	63	45	21,703,700
SDN	Sudan	65	52	20,035,490
CUB	Cuba	68	60	19,732,200
GHA	Ghana	67	58	19,654,330
GTM	Guatemala	67	56	17,595,590
ETH	Ethiopia	64	48	17,040,750
PAN	Panama	65	51	11,656,360
HND	Honduras	69	62	9,844,170
PRY	Paraguay	64	47	8,033,250
BEN	Benin	65	49	7,263,796
LVA	Latvia	70	67	6,994,120
ALB	Albania	61	39	4,728,540
GIN	Guinea	62	43	4,532,760
PSE	Palestine Authority	61	38	3,017,202
MAC	Macao	62	40	1,271,794
SLE	Sierra Leone	70	66	1,216,470
LBR	Liberia	65	53	1,127,382
CPV	Cape Verde	67	55	625,080
COM	Comoros	64	46	282,485
VCT	Saint Vincent and the Grenadines	62	42	193,957
VUT	Vanuatu	69	61	170,150
VGB	British Virgin Islands	67	54	143,903
DMA	Dominica	70	64	143,903

Table 10 - Group D

Rating	Count	CCR	CCR	tCO2/y
D	44	77	List #	2,947,234,126
IDN	Indonesia	79	96	609,786,000
MEX	Mexico	72	74	391,707,000
GBR	United Kingdom	72	70	326,265,000
ITA	Italy	77	89	302,280,000
EGY	Egypt	73	76	235,820,000
ESP	Spain	74	83	213,339,000
ARG	Argentina	82	103	169,262,600
PHL	Philippines	72	72	135,661,500
VEN	Venezuela	75	86	76,467,700
ROU	Romania	76	87	74,138,000
MAR	Morocco	79	99	64,720,400
HUN	Hungary	85	110	47,284,200
PRT	Portugal	73	78	41,800,000
IRL	Ireland	79	97	35,153,400
TUN	Tunisia	80	101	27,578,260
DOM	Dominican Republic	72	71	26,379,840
JOR	Jordan	84	107	24,942,200
BOL	Bolivia	82	105	21,067,600
HRV	Croatia	78	94	16,870,500
LTU	Lithuania	83	106	13,653,100
SEN	Senegal	81	102	12,743,870
PNG	Papua New Guinea	82	104	8,325,120
ZMB	Zambia	76	88	7,280,660
MOZ	Mozambique	85	111	6,669,400
MKD	North Macedonia	85	109	6,649,550
BWA	Botswana	79	98	6,258,590
GAB	Gabon	74	80	5,692,800
BFA	Burkina Faso	78	93	5,388,988
MDA	Moldova	80	100	5,250,300
GNQ	Equatorial Guinea	78	92	4,989,120
MUS	Mauritius	78	91	4,208,360
MDG	Madagascar	72	73	4,000,584
NAM	Namibia	75	84	3,945,140
MRT	Mauritania	73	79	3,855,280
RWA	Rwanda	75	85	1,661,876
SSD	South Sudan	74	82	1,498,834
FJI	Fiji	71	69	1,430,810
PYF	French Polynesia	74	81	924,224
BDI	Burundi	71	68	657,129
BLZ	Belize	73	77	614,674
LCA	Saint Lucia	77	90	441,095
GRD	Grenada	73	75	285,960
KNA	Saint Kitts and Nevis	85	108	215,855
KIR	Kiribati	78	95	69,607

Table 11 - Group E

Rating	Count	CCR	CCR	tCO2/y
E	35	92	List #	4,553,560,059
IND	India	92	132	2,445,009,000
DEU	Germany	96	140	639,380,000
TUR	Turkey	89	121	413,433,000
THA	Thailand	91	128	277,369,000
NLD	Netherlands	96	139	137,850,000
BEL	Belgium	99	145	90,368,000
CHL	Chile	89	119	83,833,600
AUT	Austria	90	122	62,037,500
GRC	Greece	88	117	55,610,400
ISR	Israel	86	114	55,008,000
NOR	Norway	91	131	41,196,000
FIN	Finland	87	115	37,595,900
MMR	Myanmar	91	130	36,088,900
NZL	New Zealand	94	136	34,456,700
SVK	Slovakia	96	138	31,094,700
SYR	Syria	95	137	26,159,700
NPL	Nepal	96	141	13,944,480
SVN	Slovenia	90	124	12,866,260
GEO	Georgia	99	143	10,690,600
ZWE	Zimbabwe	93	134	10,607,850
KGZ	Kyrgyzstan	90	127	8,488,700
CYP	Cyprus	97	142	7,269,600
JAM	Jamaica	90	126	6,943,530
ARM	Armenia	86	113	6,430,660
GUY	Guyana	100	146	3,190,970
MNE	Montenegro	88	116	2,451,266
BRB	Barbados	88	118	1,021,588
ABW	Aruba	99	144	778,950
SYC	Seychelles	94	135	538,384
BMU	Bermuda	91	129	497,404
AND	Andorra	90	123	448,884
ATG	Antigua and Barbuda	93	133	425,452
WSM	Samoa	86	112	286,161
TON	Tonga	90	125	170,150
MSR	Montserrat	89	120	18,770

Table 12 - Group F

Rating	Count	CCR	CCR	tCO2/y
F	34	121	List #	8,567,596,157
USA	United States	149	180	4,715,710,000
JPN	Japan	111	156	1,042,224,000
KOR	South Korea	142	178	597,633,000
VNM	Vietnam	122	165	328,899,700
POL	Poland	120	164	303,524,000
TWN	Taiwan	132	174	264,266,000
MYS	Malaysia	124	168	259,481,500
UKR	Ukraine	127	170	206,940,000
IRQ	Iraq	133	175	173,507,100
DZA	Algeria	118	160	172,504,100
UZB	Uzbekistan	145	179	118,239,700
CZE	Czechia	118	161	91,855,000
BLR	Belarus	126	169	58,592,000
SRB	Serbia	129	173	44,549,100
AZE	Azerbaijan	110	155	37,508,100
BGR	Bulgaria	103	149	36,967,200
LBN	Lebanon	113	157	24,475,160
BIH	Bosnia and Herzegovina	139	177	20,932,900
KHM	Cambodia	129	172	18,703,280
TJK	Tajikistan	128	171	9,434,050
EST	Estonia	106	151	9,343,000
XKX	Kosovo	135	176	8,521,770
LUX	Luxembourg	116	158	8,096,500
ISL	Iceland	108	153	3,328,870
SUR	Suriname	103	148	2,607,636
LSO	Lesotho	105	150	2,188,046
BHS	Bahamas	102	147	2,166,670
MDV	Maldives	119	163	2,061,136
BTN	Bhutan	124	167	1,499,692
ERI	Eritrea	107	152	783,140
GRL	Greenland	109	154	500,478
TCA	Turks and Caicos Islands	123	166	309,705
FSM	Micronesia (country)	119	162	154,682
COK	Cook Islands	117	159	88,942

Table 13 - Group G

Rating	Count	CCR	CCR	tCO2/y
G	28	210	List #	16,440,549,561
CHN	China	159	184	10,956,210,000
RUS	Russia	167	187	1,624,220,000
IRN	Iran	170	188	729,977,000
SAU	Saudi Arabia	200	195	661,193,000
CAN	Canada	161	185	534,864,000
ZAF	South Africa	166	186	435,833,000
AUS	Australia	171	189	399,922,000
KAZ	Kazakhstan	216	197	278,404,000
ARE	United Arab Emirates	202	196	199,084,000
KWT	Kuwait	244	203	99,778,600
QAT	Qatar	286	206	92,860,700
OMN	Oman	193	194	72,506,300
TKM	Turkmenistan	241	202	72,035,800
LBY	Libya	174	190	58,565,300
PRK	North Korea	245	204	55,336,400
MNG	Mongolia	342	208	49,605,160
BHR	Bahrain	260	205	37,602,760
TTO	Trinidad and Tobago	321	207	35,756,300
LAO	Laos	221	198	20,487,800
BRN	Brunei	230	199	10,553,160
COG	Congo	181	191	7,529,860
NCL	New Caledonia	241	201	5,386,590
CUW	Curacao	191	193	1,673,600
SXM	Sint Maarten (Dutch part)	187	192	588,130
PLW	Palau	232	200	232,023
MHL	Marshall Islands	153	181	154,682
AIA	Anguilla	156	182	131,390
NRU	Nauru	158	183	58,006

Climate Change Rating Results on the Website

The Climate Change Rating results according to this work are available on the website nowagreen.com/ccr [2].

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